

(19)



JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **03205929 A**

(43) Date of publication of application: **09 . 09 . 91**

(51) Int. Cl

**H04B 10/16**  
**G02B 6/00**  
**G02F 1/35**  
**H04B 3/46**  
**H04B 10/08**

(21) Application number: **01317572**

(22) Date of filing: **08 . 12 . 89**

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**(54) OPTICAL REPEATER AND OPTICAL REPEATING SYSTEM**

(57) Abstract:

**PURPOSE:** To obtain a compact optical repeater provided with a monitoring function by modulating an exciting light for amplifying an optical signal with a prescribed oscillation frequency and executing the loop-back.

**CONSTITUTION:** For instance, when an input to an incoming repeating part 11 is interrupted, and the output of a main signal amplified from a fiber amplifier 13-1 is interrupted, a no-signal detecting circuit 27-1 outputs a control signal 28-1, and an optical shutter 29-1 sets an optical fiber 31-1 to a conduction state. Also, the oscillator 32-2 of an outgoing an outgoing repeating part 12 supplies the modulating signal 33-2 of a prescribed frequency to a fiber amplifier 13-2, and modulates the exciting light of a pump light source 17-2. A modulated optical signal outputted from the fiber amplifier 13-2 is supplied to a multiplexer 23-1 of the incoming repeating part 11 side through a demultiplexer 21-2 and the optical fiber 31-1, and transmitted to the incoming circuit from an output part

15-1. In such a manner, a fault such as a disconnection of a cable can be detected.

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